



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,932	10/31/2005	David Michael Doddrell	UNI-116 US	2837
23520	7590	02/08/2008	EXAMINER	
MAURICE M KLEE				FETZNER, TIFFANY A
1951 BURR STREET				
FAIRFIELD, CT 06824				
ART UNIT		PAPER NUMBER		
		2859		
MAIL DATE		DELIVERY MODE		
02/08/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

TH

Office Action Summary	Application No.	Applicant(s)
	10/525,932	DODDRELL ET AL.
	Examiner	Art Unit
	Tiffany A. Fetzner	2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 19 June 2007.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-18 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-18 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 19 June 2007 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED Final ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings filed June 19th 2007 are approved by the examiner in view of the Remarks of the June 19th 2007 amendment and response.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Fox., US patent 4,763,074 issued August 9th 1988.**

5. With respect to **Amended Claim 1**, Fox teaches and shows "A radio frequency (RF) coil array for use in resonance imaging and/or analysis of a subject located within a space in which a magnetic field is operatively applied in a first direction" [See figures 1 through 7; the abstract, col. 1 lines 6 through col. 15 line 68. Fox shows in figures 2a, 2b, 4a, and 1] "the coil array comprising a plurality of coil elements angled relative to each other" (see coils 12 and 14) "and electrically separate from each other" [See fig. 2a.] "each coil element" (i.e. coils 12, 14) "having a pair of main conductors" (i.e. the linear z-axis portion of coils 12, 14;) "extending generally parallel to the direction of the magnetic field and located on opposite sides of the space" [See figures 1 through 7; the abstract, col. 1 lines 6 through col. 15 line 68.] "and a pair of connection conductors" (i.e. the arching curved portions of 12, 14) which are "connected between respective

Art Unit: 2859

ends of the main conductors". (I.e. the linear z-axis portion of coils 12, 14;) [See figures 1 through 7; the abstract, col. 1 lines 6 through col. 15 line 68.

6. With respect to **Claim 2**, **Fox** shows from figures 1 through 4c that "the space is a cylindrical space and the main conductors extend axially and are located diametrically opposite each other." [See figures 1 through 4c, and especially figures 2a, 2b, 4a, 4c.] The same reasons for rejection, which apply to **claim 1** also apply to **claim 2** and need not be reiterated.

7. With respect to **Amended Claim 3**, **Fox** shows from figures 1, 2a, 2b, 4a, 4b, 4c that "the coil elements are angularly spaced about the axis of the cylindrical space, and are each located in a respective diametric plane of the cylindrical space." [See figures 1, 2a, 2b, 4a, 4b, 4c.] The same reasons for rejection, which apply to **claims 1, 2** also apply to **claim 3** and need not be reiterated.

8. With respect to **Claim 4**, **Fox** shows from figures 1, 2a, and 4a, that "the coil elements are equi-angularly spaced", **Fox** shows that "the angle between adjacent coils being $360/N$, where N is the number of coil elements in the array". [See figures 4a, 2a.] The same reasons for rejection, which apply to **claims 1, 2, 3** also apply to **claim 4** and need not be reiterated.

9. With respect to **Amended Claim 5**, **Fox** shows from figures 2 through 5 that "at least one the connection conductor" [See the arching conductor(s) of coils 12, 14)] extend(s) around the periphery of the cylindrical space at a-respective an axial end thereof to thereby permit access to the cylindrical space through that end." [See figures 2 through 5.] The same reasons for rejection, which apply to **claims 1, 2,** also apply to **claim 5** and need not be reiterated.

10. With respect to **Claim 6**, **Fox** shows from figures 1 that "the coil elements are arranged in one or more orthogonal pairs." [See figure 1, col. 1 line 6 through col. 15 line 68, and the abstract.] The same reasons for rejection, which apply to **claims 1, 2,** also apply to **claim 6** and need not be reiterated.

11. With respect to **Amended Claim 7**, **Fox** teaches and shows a "Resonance imaging apparatus" [See figures 1-9, col. 1 line 6 through col. 15 line 68; and the abstract.] "comprising a space for receiving a subject to be imaged," [See figures 1, 2a,

Art Unit: 2859

2b, 4a, 4b, 4c and the intrinsic imaging space within the coils of figures 1, 2a, 2b, 4a, 4b, 4c.] "magnet means for applying a magnetic field to the space in a first direction, and a radio frequency (RF) coil array" [See figures 1-9, col. 1 lines 6 through col. 15 line 68] "comprising a plurality of angularly spaced coil elements, each coil element having a pair of main conductors extending generally parallel to the direction of the magnetic field and located on opposite sides of the space, and a pair of connection conductor connected between respective ends of the main conductors." (I.e. the linear z-axis portion of coils 12, 14;) [See figures 1 through 4c, and the **rejection of claim 1** above, as well as the electrical arching connection conductors 12, 14 shown in the cited figures.] The same reasons for rejection, which apply to **claims 1, 2**, also apply to **claim 7** and need not be reiterated.

12. With respect to **Claim 8**, **Fox** shows from figures 1 through 4c that "the space is a cylindrical space and the main conductors extend axially and are located diametrically opposite each other." [See figures 1 through 4c, and especially figures 2a, 2b, 4a, 4c.] The same reasons for rejection, which apply to **claims 1, 2, 7**, also apply to **claim 8** and need not be reiterated.

13. With respect to **Amended Claim 9**, **Fox** shows from figures 1, 2a, 2b, 4a, 4b, 4c that "the coil elements are angularly spaced about the axis of the cylindrical space, and are each located in a respective diametric plane of the cylindrical space." [See figures 1, 2a, 2b, 4a, 4b, 4c.] The same reasons for rejection, which apply to **claims 1, 2, 3, 7, 8** also apply to **claim 9** and need not be reiterated.

14. With respect to **Claim 10**, **Fox** shows from figures 1, 2a, and 4a, that "the coil elements are equi-angularly spaced", **Fox** shows that "the angle between adjacent coils being $360/N$, where N is the number of coil elements in the array". [See figures 4a, 2a.] The same reasons for rejection, which apply to **claims 1, 2, 3, 4, 7, 8, 9** also apply to **claim 10** and need not be reiterated.

15. With respect to **Amended Claim 11**, **Fox** shows from figures 2 through 5 that "at least one the connection conductor" [See the arching conductor(s) of coils 12, 14)] extend(s) around the periphery of the cylindrical space at a respective an axial end thereof to thereby permit access to the cylindrical space through that end." [See figures

Art Unit: 2859

2 through 5.] [See figures 2 through 5.] The same reasons for rejection, which apply to **claims 1, 2, 7, 8**, also apply to **claim 11** and need not be reiterated.

16. With respect to **Claim 12**, **Fox** shows from figures 1 that "the coil elements are arranged in one or more orthogonal pairs." [See figure 1, col. 1 line 6 through col. 15 line 68, and the abstract.] The same reasons for rejection, which apply to **claims 1, 2, 7, 8** also apply to **claim 12** and need not be reiterated.

17. With respect to **Claim 13**, **Fox** shows from figures 1 through 9 in combination with the abstract and col. 1 line 6 through col. 15 line 68 that "each coil is used as a receiver coil, the apparatus further comprising a plurality of receiver channels each connected to a respective coil and means for combining the signals to form a composite image" [See figures 1 through 9 in combination with the abstract and col. 1 line 6 through col. 15 line 68], where in function the signals "from each coil" are combined "to form a composite image". The same reasons for rejection, which apply to **claims 1, 7**, also apply to **claim 13** and need not be reiterated.

18. With respect to **Claim 14**, **Fox** teaches that "at least one coil is **adapted** to be used as both a transmitter and receiver coil." [See col. 1 lines 56-58.] The same reasons for rejection, which apply to **claims 1, 7**, also apply to **claim 14** and need not be reiterated.

19. With respect to **Claim 15**, **Fox** shows from figures 1 that "the coil elements are arranged in one or more orthogonal pairs." [See figure 1, col. 1 line 6 through col. 15 line 68, and the abstract.] "one coil element in each pair being **adapted** for use as a transmitter coil and the other coil element in each pair being adapted for use as a receiver coil "each orthogonal pair being sequentially active", or simultaneously active as selected is shown from figure 1 where at least two different activation combinations are taught. "the apparatus further comprising a receiver channel and switching means" [See the figures 3 and 5-9] "for selectively connecting the receiver channel sequentially to the receiver coil of the active orthogonal pair". [See figures 1 through 9; col. 1 lines 6 through col. 15 line 18;] The same reasons for rejection, which apply to **claims 1, 7**, also apply to **claim 15** and need not be reiterated.

Art Unit: 2859

20. With respect to **Claim 16**, FOX teaches that independent phase shifts are provided for the individually amplified components [See col. 1 lines 6 through col. 15 line 18 and the abstract.] which shows and teaches that "each transmitter" / receiver "coil of each orthogonal pair is adapted to generate a radio frequency pulse of different amplitude and phase to the transmitter coil(s) of the other orthogonal pair(s)." The same reasons for rejection, which apply to **claims 1, 7, 15** also apply to **claim 16** and need not be reiterated.

21. With respect to **Claim 17**, FOX teaches from figures 1-9 and col. 1 lines 6 through col. 15 line 18 a switching means and computer which controls the timing of the switch means for each of the coils, in the RF array of Fox "A rotary switched RF coil array arrangement for combined imaging of a subject located in a cylindrical space, the coil array arrangement comprising a plurality of separate coils spaced angularly about the axis of the cylindrical space, each coil including a pair of main conductors extending axially on diametrically opposite sides of the cylindrical space, a receiver channel, and switching means for selectively connecting the receiver channel sequentially to the coils." [See figures 1-9 and col. 1 lines 6 through col. 15 line 18 and the abstract,] The same reasons for rejection, which apply to **claims 1, 7, 15** also apply to **claim 17** and need not be reiterated.

22. With respect to **Amended Claim 18**, FOX shows from figures 1 through 4c that "each coil has a pair of connection conductors See the arching conductor(s) of coils 12, 14)] "connected between respective ends of the main conductors" (i.e. the elongated linear portions of 12, 14), "the connection conductors ~~at one or both ends~~ being non-diametrical to permit access through the respective axial end of the cylindrical space." [See figures 1 through 4c,] The same reasons for rejection, which apply to **claims 1, 7, 15, 17** also apply to **claim 18** and need not be reiterated.

Response to Arguments

23. Applicant's arguments with respect to **claims 1-18** from the amendment and response of June 19th 2007 have been considered but are moot in view of the new ground(s) of rejection. This action is **Final**

Art Unit: 2859

24. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

25. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of **this final action**.

Prior Art of Record

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- A) **Visser et al.**, US patent 6,870,368 B2 issued March 22nd 2005, filed February 5th 2002.
- B) **Visser et al.**, US patent application publication 2002/0125888 A1 published September 12th 2002, filed February 5th 2002. This reference corresponds to the applied **Visser et al.**, US patent 6,870,368 B2
- C) **Boskamp et al.**, US patent 6,590,392 B2 issued July 8th 2003, filed April 17th 2001.
- D) **Boskamp et al.**, US patent application publication 2002/0149367 A1 published October 17th 2002, filed April 17th 2001. This reference corresponds to the applied **Boskamp et al.**, US patent 6,590,392 B2

Conclusion

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday, Wednesday, and Friday-Thursday from 7:00am to 2:10 pm., and on Tuesday and Thursday from 7:00am to 5:30pm.

Art Unit: 2859

28. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Dean Reichard**, can be reached at (571) 272-1984. The **only official fax phone number** for the organization where this application or proceeding is assigned is (571) 273-8300.

29. Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system Status information for published applications may be obtained from either Private PMR or Public PMR. Status information for unpublished applications is available through Private PMR only. For more information about the PMR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PMR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



TAF

February 4, 2008



Brij Shrivastav
Primary Patent Examiner
Technology Center 2800